Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application:

**CLAIMS**

1. (Currently Amended) A wireless headphone assembly, ~~comprising:~~ including:

at least ~~one~~ two ultrasound receivers for receiving at least ~~one~~two ultrasound signals along at least ~~one~~two ultrasound channels;

at least ~~one~~two transducers for converting each of said ~~at least one~~ ultrasound signals ~~along~~of said ~~at least one~~ ultrasound channels to ~~a~~ human audible signals, each of said two transducers being located on an earpiece;

~~and~~ wherein said at least two ultrasound receivers, called a right receiver and a left receiver, provide ultrasound signals through front and rear channels to the right and left ears of a user, wherein the right receiver provides a front right signal to the right ear and the left receiver provides a front left signal to the left ear, and wherein the right receiver provides a rear left signal to the left ear and the left receiver provides a rear right signal to the right ear,

and wherein said rear channel is accompanied by a delay operative to simulate an acoustic delay occurring between the arrival of sound from a signal source at both ears of the user.

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(Claims 2-8 Canceled.)

9. (Currently amended) A headphone system ~~providing a simulated multi-source sound environment, comprising:~~

~~at least one headphone assembly which may be worn by a user, including:~~

~~at least two ultrasound receivers for receiving at least one ultrasound signal along at least two ultrasound channels; and~~

~~at least one transducer for converting each of said at least one ultrasound signal along said at least two ultrasound channels to a human audible signal;~~

~~at least one processor receiving a multi-source signal and modulating an ultrasound carrier along a plurality of channels, in accordance with said multi-source signal; and~~

~~at least one transmitter for transmitting said modulated ultrasound carrier to the at least one headphone assembly along said plurality of channels,~~ according to claim 22, wherein the use of ultrasound for transmitting said modulated carrier to said at least one headphone assembly is operative to cause a listener using said headphone assembly to experience surround sound effects that said listener would experience if the multi-source signal were transmitted in free space as audible sound waves from suitably located sound sources.

(10. Canceled)

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11. (Currently amended) A method for simulating an artificial sound environment, comprising:

sending an ultrasound reference signal to the headphone assembly worn by a user having two ears, said headphone assembly audibly providing at least one audio signal to each of the ears;

processing arrival times of said ultrasound reference signal at each said ear, so as to measure a phase difference of said signal as perceived by one said ears in contrast to the other ear and to measure a distance between the two ears of the user;

modulating at least two audio signals, at least one signal for each said ear, in accordance with said measured difference; and

sending said at least two audio signals via said headphone assembly to each of the ears.

wherein the right receiver provides a front right signal to the right ear and the left

receiver provides a front left signal to the left ear, and

wherein the right receiver provides a rear left signal to the left ear and the left ear provides a rear right signal to the right ear.

(12-14. Canceled)

15. (Currently amended) A method ~~for~~of simulating an artificial sound environment, ~~comprising~~ according to claim 11, further including:

providing ~~a headphone system as claimed in claim 10;~~ at least two transducers for converting each of said ultrasound signals of said ultrasound channels to human audible signals, each of said two transducers being located on an earpiece;

wherein said at least two ultrasound receivers, called a right receiver and a left receiver, provide ultrasound signals through front and rear channels to the right and left ears of a user, wherein the right receiver provides a front right signal to the right ear and the left receiver provides a front left signal to the left ear, and wherein said right receiver provides a rear left signal to the left ear and said left receiver provides a rear right signal to the right ear, and

a' cont

wherein said rear channel is accompanied by a delay operative to simulate an acoustic delay occurring between the arrival of sound from a signal source at both ears of the user;

said system further including:

at least one processor receiving a multi-source signal and modulating an ultrasound carrier along a plurality of channels in accordance with said multi-source signal, and

at least one transmitter for transmitting said modulated ultrasound carrier to said headphone assembly along said plurality of channels.

measuring the distance between the ears of a user wearing said headphone assembly, and

producing an artificial sound environment in consideration of said measured distance and in response to any linear and/or angular motion of the user's head.

(16-21. Canceled)

22. (New) A headphone system providing a simulated, multi-source sound environment, including at least one headphone assembly to be worn by a user, said assembly including:

at least two ultrasound receivers for receiving at least two ultrasound signals along at least two ultrasound channels;

a' cont

at least two transducers for converting each of said ultrasound signals of said ultrasound channels to human audible signals, each of said two transducers being located on an earpiece;

wherein said at least two ultrasound receivers include a right receiver and a left receiver and provide ultrasound signals through front and rear channels to right and left ears of a user, wherein the right receiver provides a front right signal to the right ear of the user and the left receiver provides a front left signal to the left ear of the user, and wherein said right receiver provides a rear left signal to the left ear of the user and said left receiver provides a rear right signal to the right ear of the user, and

wherein said rear channel is accompanied by a delay for simulating an acoustic delay occurring between the arrival of sound from a signal source at both ears of the user;

said system further including:

at least one processor receiving a multi-source signal and modulating an ultrasound carrier along a plurality of channels in accordance with said multi-source signal, and

at least one transmitter for transmitting said modulated ultrasound carrier to said headphone assembly along said plurality of channels.

23. (New) A method for simulating an artificial sound environment, comprising:

sending an ultrasound reference signal to a headphone assembly worn by a user having two ears, said headphone assembly audibly providing at least one audio signal to each ear of the user;

determining arrival times of said ultrasound reference signal at each ear of the user, so as to measure and calculate a phase difference of said ultrasound reference signal as perceived by one of the user's ears in contrast to the other ear;

modulating at least two audio signals, at least two signals for each ear, and transmitting the signals to said headphone assembly;

characterized by:

measuring a distance between the two ears of the user;

processing the audio signals with respect to a calculated angular movement of the user's head and a measured distance between the two ears of the user; and

wherein said headphone assembly is operative to cause a user using said headphone assembly to experience psycho-acoustic surround sound effects that the user would experience if the audio signals were transmitted in free space as audible sound waves from suitably located sound sources.

24. (New) A headphone system providing a simulated, multi-source sound environment, comprising:

at least one headphone assembly having right and left earpieces, said headphone assembly including at least two ultrasound receivers for receiving at least two ultrasound signals along at least two ultrasound channels, and at least two transducers for converting each of said ultrasound signals of said ultrasound channels to human audible signals, each of said two transducers being located on an earpiece;

said system further comprising:

at least one processor receiving audio signals and modulating an ultrasound carrier along a

plurality of channels in accordance with said audio signals; and

at least one transmitter for transmitting said modulated ultrasound carrier to said headphone assembly along said plurality of channels,

characterized in that:

said processor measures the distance between right and left ears of a user and modifies the audio input to each of the ears of the user according to the measured distance;

said at least two ultrasound receivers comprise a right receiver which is located adjacent to the right earpiece and a left receiver which is located adjacent to the left earpiece, the right and left receivers providing ultrasound signals through front and rear channels to the right and left ears of the user;

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wherein:

the left ultrasound receiver provides front left, front right and centre signals to the left ear; the left ultrasound receiver provides rear left and rear right signals to the right ear; the right ultrasound receiver provides front left, front right and centre signals to the right ear; the right ultrasound receiver provides rear left and rear right signals to the left ear; and

wherein:

the front right signal provided to the left ear is delayed with respect to the front right signal provided to the right ear; the front left signal provided to the right ear is delayed with respect to the front left signal provided to the left ear; the rear right signal provided to the left ear is delayed with respect to the rear right signal provided to the right ear; the rear left signal provided to the right ear is delayed with respect to the rear left signal provided to the left ear;

thereby a relative delay is introduced between the left and right signals, so as to also produce a virtual speaker effect with respect to said user.